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# OCCUPATIONAL CHARACTERISTICS, TECHNOLOGY USE AND OUTPUT DETERMINANTS AMONG FISHERFOLKS IN OGUN WATERSIDE AREA, OGUN STATE

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## ABSTRACT

This study examines the occupational characteristics and technology options of capture fisheries in Ogun Waterside Local Government Area of Ogun State. Data were collected from respondents selected randomly from four fishing communities in the local government using questionnaires. Descriptive statistics were used to analyse the data. Most of the respondents are male, aged above 30 and had minimal education. Lagoon fishing is the most common and there was an inverse relationship between fishing water distance and frequency of fisher folk plying the route. Non-motorized fishing technologies were used by most of the respondents. The significant variables in the regression analyses are fixed production costs and high sea fishing. Recommendations centered on the need to improve on husbandry practices in the fishing sector in the study area and policy assistance in equipment procurement.

Keywords: Fishing technology, Fishing income, Technology use

## INTRODUCTION

Nigeria has the eighth largest national population in the world and about a quarter of the total population of all the countries in Sub-Saharan Africa. Nigeria is located approximately between latitude 4° and 14° North of the Equator, and between longitudes 2° 2' and 14° 30' East of the Greenwich meridian. The population is more than 100 million, spread unevenly over a national territory of 923,770 km<sup>2</sup>. The climate, which affects the quality and quantity of the country's water resources, results from the influence of two main wind systems: the moist, relatively cool, monsoon wind which blows from the south-west across the Atlantic Ocean towards the country and brings rainfall, and the hot, dry, dust-laden harmattan wind which blows from the north-east across the Sahara desert with its accompanying dry weather and dust-laden air (Sarch et al, 1997).

Nigeria has abundant water resources although they are unevenly distributed over the country. The highest annual precipitation of about 3,000 mm occurs in the Niger Delta and mangrove swamp areas of the south-east, where rain falls for more than eight months a year. There is a progressive reduction in precipitation northwards with the most arid north-eastern Sahelian region receiving as little as 500 mm precipitation from about 3-4 months of rainfall.

Water, sourced principally from rainfall, has been the driving force behind generations of men who since the seventeenth century have explored and inhabited lands long thought useless. These natural rural ecosystems are challenging for human habitation and they lack the infrastructure to enable the inhabitants to pursue a more progressive development (Palsson, 1991). The human families that live here, however, have come to depend heavily on harvests from the aquatic ecosystems for their livelihood. Although there are a few rich fishermen in different parts of the country, majority are poorer than the average rural dweller. They still live a difficult existence and they still own very few material possessions, yet, they are very important contributors to the nutritional well being of various populations of the world in terms of the food supply of aquatic organisms from the wild waters (Binkley, 1995).

According to Mays (1977) and Anderson (1976), man's existence became semi aquatic because he had become aware that he had arms with which to paddle; family members find movement within or across water bodies, large or small, less tiring than walking. The men built the canoes that the women used for the transportation of their families and food across water bodies as well as for harvesting of aquatic animals and plants.

Fishing is an ancient human tradition. It is a traditional activity involving the hunting and gathering of aquatic products for food. Fish and marine products include freshwater and ocean fish, shellfish, ocean mammals and seaweed as well as plankton. They represent a major food source, which is invaluable for the protein they provide and the industrial products they produce. Fish satisfies a vital food need for billions. Fish is also economically, socially and culturally important as a global dietary aspect of sustainable food security. Economically fish provides an important source of food and income for both men and women and fishing has an important social and cultural position in riverine communities. However, the tradition of fishing has been transformed over several decades of human civilisation to become a resource extraction industry spanning the entire globe. Man first learned to catch fishes in traps and nets. These fishing activities were limited at first to the lakes and rivers, but as men improved on the boats and fishing technologies, they ventured into sheltered coastal areas, river mouths and eventually farther out on to the continental shelves, relatively shallow ocean plains between the land and the deeper ocean areas.

Fishing technology has continued to develop throughout history, employing improved and larger ships, more sophisticated fishing equipment and various food preservation methods. In the middle of the 20th century, man became concerned with greater utilisation of the resources of the world's waters to feed an expanding population and especially in filling the need for high protein foods (Pauly et al, 2001 and FAO, 2000).

This study intends therefore to examine the state of fishing in Nigeria in the light of the socioeconomic characteristics of fishermen respondents, analyse the occupational data of the different respondents and examine the different types of fishing technology in use in the study area. The study will also examine the determinants of fish catch and fishing household income in the study area.

## METHODOLOGY

### *The Area of Study*

The area of study is Ogun Waterside Local Government Area in the Ijebu Division of Ogun State. The choice of the local government is by its close proximity to the Atlantic Ocean and its relative endowment with a complex network of streams, rivers, brackish water and in particular the extension of the Lagos (Lekki) Lagoon to the area.

### *Sampling Procedure*

The study used multistage sampling techniques. In the first stage, four major fishing settlements are selected purposively. In the second stage, 85 fisher folks were selected randomly from those in the different villages.

### *Data Collection and Analysis*

Data were obtained on the socioeconomic characteristics of the respondents such as sex, age and the number of years of formal education of the respondents. Data were also obtained on the occupational characteristics of the respondents and the different fishing technologies used by them. The analytical techniques used are descriptive statistics and contingency analyses.

In order to identify the salient factors that determine the level of fish catch per week in the study area, the following regression function was fitted by the OLS technique to the study data.

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9)$$

Where Y = Fish catch per week (kg)

$X_1$  = Fixed costs less depreciation (naira)

$X_2$  = Number of fishing trips per week

$X_3$  = Number of years of formal education

$X_4$  = Man hours of labour per week

$X_5$  = Age (years)

$X_6$  = Dummy variable for fishing grounds (high sea fishing = 1 and lagoon/river fishing = 0)

$X_7$  = Fishing experience (years)

$X_8$  = Loan amount (naira)

$X_9$  = Dummy variable for sex (male = 1 and female = 0)

The study also undertakes to empirically determine the degree of influence of selected variables on the amount of weekly income from fishing among artisanal fishermen in the study area. The regression is expressed thus;

$Z = f(V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8, V_9)$

Where  $Z$  = Average weekly income (naira)

$V_1$  = Fixed costs less depreciation (naira)

$V_2$  = Number of fishing trips per week

$V_3$  = Number of years of formal education

$V_4$  = Man hours of labour per week

$V_5$  = Age (years)

$V_6$  = Dummy variable for fishing grounds (high sea fishing = 1 and lagoon/river fishing = 0)

$V_7$  = Fishing experience (years)

$V_8$  = Loan amount (naira)

$V_9$  = Dummy variable for sex (male = 1 and female = 0)

## RESULTS AND DISCUSSIONS

### *Socioeconomic Characteristics*

The results of the analysis of socioeconomic characteristics of the fisher folks respondents are as seen in Table 1. Almost all the respondents are male; a confirmation of the fisherman stereotype as the work rate of an active fisherman is strenuous and tasking, relegating women to the role of processors of male catch. The bulk (39 per cent) of respondents is aged above 30, which age gives a fair indication of the apprenticeship period for the fishing business in the study area. Although only about 3 per cent of the respondents attended post-secondary institutions, less than a quarter of the respondents are uneducated. This has implications for their willingness to adopt new technology and fishing practices.

### *Occupational Characteristics of Fisher Folks*

The occupational characteristics of the fisher folks are as seen in Table 2. More than half of the respondents carry out their fishing activities in the lagoon. Fishing in the seas comes a distant second while the least number of farmers practices river fishing. This distribution is attributable to the relative abundance of fishes, relative risk and the ease of navigation in the different water bodies. There is an inverse relationship between fishing water distance and frequency of fisher folk plying the route. Fishing in Ogun Waterside is largely handed down from parent to child. The realities on ground in the area were that the children were brought up from a young age to learn the skills of fishing from the parents and other family members and were released from the family business only upon the onset of maturity. Almost half of the respondents earned more than a quarter of a million in fishing income annually.

### *Technology Use by Fisher Folks*

The technology used by fisher folks in the study area is principally of two types. There are motorised and non-motorised technologies. The details of the two broad technologies are as seen in Table 3. Thirty six per cent of the respondents use motorised technologies with the most used being the net trap and gill net. The non-motorised fishing technology used by the greatest number of fisher folks are the hook and line and the gill net with paddle.

### *Determinants of Fish Catch*

The results of the equation to estimate the determinants of fish catch (significant variables only) are as seen below.

$$Y = -3.861 + 0.008X_1^* + 8.087X_6^*$$

std. error (2.778) (0.002) (5.088)  
Adj. R<sup>2</sup> = 0.79 F = 16.285\*

\* - significant at the 1 per cent level

The results show that fixed cost of production (less depreciation) and high sea fishing determine weekly fish catch. The adjusted coefficient of multiple determination shows that the significant variables are responsible for 79 per cent of the variation in weekly fish catch.

### *Determinants of Fishing Income*

The results of the estimation of the determinants of weekly fishing income are as seen in the equation below (significant variables only).

$$Z = -1.032 + 0.088V_1^* + 3.494V_4^{**} + 5.571V_6^*$$

Std. error (3.476) (0.024) (1.341) (4.830)  
Adj. R<sup>2</sup> = 0.736 F = 7.902\*

\* - significant at the 1 per cent level

\*\* - significant at the 5 per cent level

The results show that fixed production cost (less depreciation), labour man-hours worked per week and fishing on the high seas are the variables that positively affect the weekly income of artisanal fisher folks in the study area. The left hand side variables are responsible for 73.6 per cent of the variation in the weekly fishing income.

### CONCLUSION

Evidence in this study has shown that fishing in the Ogun Waterside Local Government Area is a male occupation while additional value is added to fish catch via processing by spouses. Relative literacy among respondents suggested the likelihood of an easy uptake of conventional fishing technologies and practices especially if the study area is adequately covered by the extension systems of Ogun State, and Nigeria. The fact that more than half of the respondents fish within the lagoon suggests a need for guidance on operation of fishing regimes / harvesting programme in the study area so as to prevent over-fishing and extinction of some species, thereby encouraging sustainable fishing and livelihoods among fisher folks. Also, in this regard, better fishing gear should be introduced to prevent excessive concentration on lagoon fishing, and to encourage in part, river and ocean fishing, which require superior fishing gear and technologies, in the area. The results of the regression analyses show that both weekly catch and income are affected positively and significantly by fixed production costs and high sea fishing. This, by implication, means that the greater the scale of operation on the fisher folks, the greater the catch and income. This is more so when they fish in the high seas. Policy assistance in equipment procurement is thus a sine qua non. With this, the fisher folks' production level can be upped significantly.

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Table 1: Socioeconomic Characteristics of Respondents

Socioeconomic Characteristics	Frequency	Percentage	Cumulative Percentage
Sex of Respondents			
Male	81	95.3	95.3
Female	4	4.74	100
Age of Respondents in years			
Less than 30	7	8.2	8.2
31-40	33	38.8	47.1
41-50	22	25.9	72.9
Above 50	23	27.1	100
Fishing Experience of Respondents in years			
Less than 10	8	9.4	9.4
11-20	30	35.3	44.7
21-30	19	22.4	67.1
31-40	15	17.6	84.7
Above 40	13	15.3	100
Number of Years of Education of Respondents			
None	18	21.2	21.2
1-6	31	36.5	57.7
7-12	33	38.8	96.5
Above 12	3	3.5	100

*Source: Field Survey, 2000*

Table 2: Occupational Characteristics of Respondents

Occupational Characteristics	Frequency	Percentage	Cumulative Percentage
Distribution of Respondents by Location of Fishing Activities			
Adjoining Lagoon	54	63.5	63.5
River Network	12	14.1	77.6
High Seas	19	22.4	100
Distribution of Respondents by Distance Covered in Fishing Activities in km			
Less than 10	43	50.6	50.6
11-20	23	27.1	77.6
21-30	15	17.6	95.3
Above 30	4	4.8	100
Distribution of Respondents by Source of Fishing Knowledge			
Apprenticeship	7	8.2	8.2
Parent	61	71.8	80.0
Relative	17	20	100
Annual Income from Fishing Activities in '000s of Naira			
Less than 50	3	3.5	3.5
51-100	6	7.0	10.5
101-150	21	24.7	35.2
151-200	8	9.4	44.6
201-250	9	10.6	55.2
Above 250	38	44.8	100

*Source: Field Survey, 2000*

Table 3: Distribution of Respondents by Type of Fishing Technology

Categories of Fishing Techniques	Frequency	Percentage	Cumulative Percentage
Motorised Technologies with			
Net, trap, iken, pot, raffia fence, paddles, poles and twine	15	17.7	17.7
Fatiko net, paddle and pole	1	1.2	18.9
Gill net, paddles and steering poles	15	17.7	36.6
Non-motorised technologies			
Trap pot, twine, raffia fence, net (dermasal and veranda), iken (brushpark plant)	7	8.2	44.8
Gill net, paddle, steering poles, basket	15	17.7	62.5
Cast net, paddle and steering poles	7	8.2	70.7
Hook and line, paddle and steering poles	20	23.5	94.2
Trap, paddle and steering poles	4	4.7	98.9
Arrow hook, paddle and steering poles	1	1.1	100

*Source: Field Survey, 2000*